

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

REMARKS

This amendment is responsive to the Office Action dated March 3, 2004. Applicants have amended claims 1, 5, 8, 16, 21, and 27-32 and canceled claim 20. Claims 33-43 have been withdrawn by the Examiner as being directed to non-elected subject matter and are hereby canceled without prejudice to Applicants' presenting those claims in a divisional application. Claims 1, 3-17 and 21-32 are now pending.

As a preliminary matter, Applicants still respectively traverse the previous rejections advanced by the Examiner for various reasons already stated on the record. In particular, Applicants again submit that the prior art lacks a motivation to substitute an embossable layer of Lewis with a magnetic layer of Davis, and further submit that Lewis specifically teaches against the modification proposed by the Examiner. Applicants in no way acquiesce to any of the Examiner's characterizations of Lewis, Davis, Anderson or Smith, and neither admit nor acquiesce in the grounds of rejections advanced by the Examiner. Accordingly, Applicants reserve the right to pursue the rejected claims in one or more continuation applications.

Section 2143.01 of the MPEP clearly states that: "If a proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render claims *prima facie* obvious." In the instant case, Applicants believe that Applicants have already demonstrated that the modification of Lewis proposed by the Examiner would change the principle of operation of the Lewis invention. Moreover, Applicants have already demonstrated that the proposed modification to Lewis in view of Smith, would also change the principle of operation of the Lewis invention. Applicants address these issues again, in greater detail, below. For these reasons and various other reasons already outlined in detail on the record in previous responses, Applicants believe that the Examiner has clearly failed to establish a *prima facie* case of obviousness of the rejected claims.

Nevertheless, in the interest of expediting the prosecution of this application to issuance, Applicants have amended various claims in an attempt to address the specific concerns identified by the Examiner and the specific arguments relied upon by the Examiner in support of the current rejections. In view of the current amendments, Applicants believe that all pending claims are now clearly allowable over the prior art of record, even if one accepts the Examiners'

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

characterizations of the prior art. Again, however, Applicants neither admit nor acquiesce in the grounds of rejections advanced by the Examiner, and reserve the right to pursue the rejected claims in one or more continuation applications.

Claim Rejections

In the Office Action, the Examiner rejected claims 1, 3-6, 8-17, 20-27 and 29-30 under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. (US 4,519,065) (hereafter Lewis) in view of Davis et al. (PCT/US00/03644) (hereafter Davis); rejected claim 7 under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of Davis, and further in view of Anderson et al. (US 4,304,806) (hereafter Anderson); and rejected claims 31-32 under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of Davis and further in view of Smith et al. (US 5,739,972) (hereafter Smith).

All pending claims require a data storage medium comprising a first layer comprising a substrate, and a second layer including a photopolymer, the second layer exhibiting surface variations. In addition, all pending claims have been amended to require a third layer comprising a thin film stack of a plurality of sub-layers that together form a magnetic recording structure, the thin film stack of the third layer including an underlay to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material, and a hard coat, wherein each sub-layer of the thin film stack substantially conforms to the surface variations of the second layer, and wherein the third layer including the thin film stack forms a substantially continuous layer over the surface variations. Applicants believe that this combination of features is clearly absent from the teaching of the applied references. Moreover, Applicants believe that the current amendments specifically address arguments advanced by the Examiner, even assuming that the Examiner's characterizations of the prior art are legitimate.

As amended, claim 1 requires all of the features previously recited in claim 20. In addition, amended claim 1 also clarifies that third layer comprises a thin film stack of a plurality of sub-layers that together form a magnetic recording structure. In the current Office Action, the Examiner disputed that a thin film stack refers to a plurality of sub-layers that together form a magnetic recording structure, and instead adapted a broader interpretation of the phrase "thin film stack." The current amendment to the claims, to specifically recite that the thin film stack refers

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

to a plurality of sub-layers that together form a magnetic recording structure, should obviate any of the Examiner's concerns on this issue.

In a previous response, Applicants argued that nothing in the applied references discloses or suggests a third layer comprising a thin film stack that substantially conforms to the surface variations of the second layer. The Examiner has stated that a metal layer, a magneto-optic layer and a protective layer substituted from the teaching of Davis for the metalized layer of Lewis would be equivalent to Applicants' claimed thin film stack. In a previous response, Applicants disputed this characterization of the prior art, and argued that a person with ordinary skill in the art would recognize that a thin film stack comprising a plurality of sub-layers is nothing akin to the combination of layers of Lewis and Davis proposed by the Examiner. In particular, Applicants argued that no fair interpretation of a thin film stack would be equivalent to the combination of a metal layer of Lewis with magneto-optic layers and protective layers of Davis, proposed by the Examiner. Applicants also argued that a thin film stack is well known in the art to refer to a combination of sub-layers that collectively provide a magnetic recording structure for the medium. The Examiner disagreed, and maintained that a person with ordinary skill in the art would have been motivated to substitute a magneto-optic structure, i.e., a metal layer, a magneto-optic layer and a protective layer, from the teaching of Davis for the metal layer of Lewis. The Examiner stated that the substituted magneto-optic structure would amount to a thin film stack, as recited in the rejected claims.

Specifically, the Examiner rejected claim 20 based on his conclusion that a person with ordinary skill in the art would have been motivated to replace a embossable metal layer of Lewis, with a magneto-optic recording structure of Davis. Again, this conclusion of obviousness is based on an interpretation of "magneto-optic recording structure" as being equivalent to a thin film stack. The Examiner further argued that Davis teaches that optical, magneto-optic and magnetic layers are equivalent for forming an information bearing surface, and therefore, a person with ordinary skill in the art would have been motivated to substitute embossable metal layers of Lewis with magneto-optic recording structure of Davis insofar as both are information bearing surfaces. Applicants respectfully point out that these conclusions by the Examiner violate the specific requirements of MPEP 2143.01 which states that: "If a proposed modification or combination of the prior art would change the principle of operation of the prior art invention

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

being modified, then the teachings of the references are not sufficient to render claims *prima facie* obvious." In the instant case, the Examiner's proposed modification would change the invention described in Lewis to some type of patterned magneto-optic structure, which would clearly change the principle of operation of the prior art invention being modified, in violation of the rule provided in MPEP 2143.01. Moreover, Applicants question whether a person with ordinary skill in the art would have had a reasonable expectation of success in the modifications to Lewis proposed by the Examiner, which is also specifically required for an obviousness determination. See MPEP 2142.

Nevertheless, in order to specifically address the Examiner's rejections and apparent concerns, Applicants have now included a more specific definition of "thin film stack" within the claim language of all pending independent claims. In particular, all pending claims have been amended to require a third layer comprising a thin film stack of a plurality of sub-layers that together form a magnetic recording structure, the thin film stack of the third layer including an underlay to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material, and a hard coat, wherein each sub-layer of the thin film stack substantially conforms to the surface variations of the second layer, and wherein the third layer including the thin film stack forms a substantially continuous layer over the surface variations. The added limitation, which indicates that the thin film stack comprises a plurality of sub-layers that together form a magnetic recording structure, finds support in Applicants' specification, e.g., at page 4, lines 1-11.

Neither Davis, Lewis, nor any of the other applied references discloses or suggests a medium including a first layer comprising a substrate, a second layer comprising a photopolymer and exhibiting surface variations, and a third layer comprising a thin film stack of a plurality of sub-layers that together form a magnetic recording structure, the thin film stack of the third layer including an underlay to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material, and a hard coat, wherein each sub-layer of the thin film stack substantially conforms to the surface variations of the second layer, and wherein the third layer including the thin film stack forms a substantially continuous layer over the surface variations. Applicants submit that this clarification regarding the meaning of "thin

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

film stack" not only further distinguishes the applied references, but also specifically addresses the Examiner's concerns expressed in the latest Office Action.

With regard to the previous rejection of claim 20, Applicants also note that neither Davis nor Lewis appears to disclose or suggest the claimed "underlay" which is recited as part of the thin film stack which forms a magnetic recording structure. This "underlay" like the other sub-layers of the thin film stack is required to be substantially conforming to the surface variations of the second layer. This feature is now required in all pending claims, and finds support in Applicants' specification, e.g., at page 8, lines 25-28. Applicants have further specifically defined the underlay as being a sub-layer that improves growth of microstructures of the sub-layers of the thin film stack during fabrication, which also finds support in Applicants' specification e.g., at page 8, lines 25-28..

Applicants would also like to once again briefly address, for the record, the Examiner's argument that a person with ordinary skill in the art would have considered optical, magneto-optical and magnetic layers to be equivalent. Applicants dispute this conclusion, particularly in the context of the teaching of Lewis, which specifically requires an embossable metal layer in the media taught by Lewis. The Examiner has essentially argued that a person with ordinary skill in the art would have been motivated to substitute any information bearing surface for the embossable metal layer of Lewis, because different information bearing surfaces, such as magnetic, magneto-optic, and reflective layers, are known layers in the art for storing machine-readable data.

Applicants submit, however, that regardless of whether different information bearing surfaces can be applied to a substrate, a person with ordinary skill in the art would not consider such layers "equivalent" for use in a medium taught by Lewis. In other words, the fact that Davis mentions different information recording layers as being alternatives for fabricating alternative types of media does not establish equivalency of the layers with respect to the teaching of Lewis, particularly if one or more of the alternatives proposed by Davis would be non-embossable and therefore, inadequate for use in a medium taught by Lewis. Insofar as Lewis requires an embossable layer, the Examiner must also establish that the substitution proposed by the Examiner would still have been embossable, and therefore resulting in a reasonable expectation of success. See MPEP 2142. Otherwise, the hypothetical medium created by modifying the

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

teaching of Lewis with the teaching of Davis would undermine the stated goal of Lewis of creating embossable media with an embossable metal layer that can be embossed after media fabrication. Moreover, the Examiner's proposed modification to Lewis would change the invention described in Lewis to some type of patterned magneto-optic structure, which would clearly change the principle of operation of the prior art invention being modified in violation of MPEP 2143.01. For these reasons, Applicants still believe that the previous rejections were inappropriate, and Applicants specifically reserve the right to pursue the previously rejected claims in one or more continuation applications.

At this stage, however, all pending independent claims have been amended to require a third layer comprising a thin film stack of a plurality of sub-layers that together form a magnetic recording structure, the thin film stack of the third layer including an underlay to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material, and a hard coat, wherein each sub-layer of the thin film stack substantially conforms to the surface variations of the second layer, and wherein the third layer including the thin film stack forms a substantially continuous layer over the surface variations. Again, Applicants submit that this clarification regarding the meaning of "thin film stack" not only distinguishes Davis and Lewis, but also specifically addresses the Examiner's concerns.

With regard to claims 25 and 27-31, Applicants once again submit that incorporation of a lubrication layer onto the medium described in Lewis would have not made sense to a person with ordinary skill in the art. The Examiner has indicated that a person with ordinary skill in the art would have been motivated to make this combination due to the increased slipperiness/abrasion resistance of the surface. The Examiner yet failed, however, to indicate why a person would have been motivated to make an embossable optical video disk (or capacitive readout disk), as disclosed in Lewis, slippery and abrasively resistant, considering the fact that such a disk does not physically interact with a head.

The mere fact that adding lubrication increases the slipperiness/abrasion resistance of the surface begs the question of why a person with ordinary skill in the art would have been motivated to increase the slipperiness/abrasion resistance of an optical video disk, as disclosed in Lewis. Applicants submit that the Examiner has failed to identify any legitimate reason why a person with ordinary skill in the art would have added a lubrication layer to a disk, as disclosed

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

in Lewis, in order to make the disk slippery and abrasively resistant, considering the fact that the disks disclosed in Lewis do not physically interact with a head in the way that conventional media, which includes a lubrication layer, might so interact. Moreover, like the other modifications to Lewis proposed by the Examiner, the modification to Lewis to include a lubrication surface would appear to change the nature of the invention being modified, which contradicts the Examiner's conclusion of obviousness under MPEP 2143.01.

With regard to the rejections of claims 29-32, Applicants wish to make a few additional remarks in further rebuttal of the Examiner's obviousness conclusions. Claim 29 requires a substantially transparent plastic substrate including optically detectable features formed in the substrate, a reflective layer to facilitate optical detection of the optically detectable features via reflection of an optical signal, a photopolymer layer formed over the reflective layer, the photopolymer layer being formed with surface variations, a thin film stack comprising a plurality of sub-layers that together form a magnetic recording structure, the thin film stack, including an underlayer to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material and a hard coat, and wherein the thin film stack substantially conforms to the surface variations, and a lubrication layer substantially conforming to the surface variations, wherein the surface variations are arranged to define a topology which creates detectable changes in ambient conditions as a transducer flies over the data storage medium.

In rejecting claim 29, the Examiner appears to be arguing that a person with ordinary skill in the art would have modified Lewis by substituting a metal layer for a magneto-optic structure, which the Examiner asserts is equivalent to Applicant's claimed thin film stack. However, claim 29 also requires a reflective layer. To address this feature, the Examiner appears to be stating that the person with ordinary skill in the art would have further modified Lewis to include the metal layer that was substituted by the Examiner for the magneto-optic structure. Applicants respectfully submit that such hindsight-based analysis cannot withstand legal scrutiny, and is contrary to the legal requirements for establishing a *prima facie* case of obviousness. The Examiner is clearly mixing and matching features from Lewis and Davis without identifying any legitimate motivation in the prior art that would have led a person with ordinary skill in the art to make the modifications. For example, why would a person with ordinary skill in the art

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

substitute the metal layer of Lewis for a magneto-optic structure of Davis, and then furthermore, upon making this substitution, why would a person with ordinary skill in the art use the metal layer of Lewis, particularly after making the substitution proposed by the Examiner? As another point, Applicants respectfully note that the Examiner has not addressed the requirement of claim 29 that the substrate includes optically detectable features formed in the substrate. The substrate of Lewis does not include optically detectable features, as optically detectable features are instead formed in the embossable layer of Lewis.

The rejection of claim 21 presents similar logical problems to the rejection of claim 29. Claim 21 is a dependent claim of claim 1 (and was formerly dependent on claim 20). Claim 21 requires that the underlay include a chrome alloy and the magnetic recording material include a cobalt alloy. In rejecting this claim, the Examiner stated that when a Cr alloy is utilized as the reflecting layer of Lewis and a Co alloy layer is utilized as a magneto-optic layer in the combination of Lewis as modified by Davis, the references meet the limitations of claim 21. In the previous analysis of independent claim 1, however, the Examiner proposed that a person with ordinary skill in the art would have substituted the metal (reflecting) layer of Lewis with the magneto-optic structure of Davis. The Examiner evidently thinks that a person with ordinary skill in the art would have made a substitution of the optic structure of Davis for the metal layer of Lewis in order to realize the media recited in claim 1, but then would have combined these substituted layers in order to realize the media recited in claim 21. Such a hindsight-based analysis cannot withstand legal scrutiny.

In rejecting claims 31 and 32, the Examiner argued that a person with ordinary skill in the art would have been motivated to modify optical video disks of Lewis with a magnetic layer disclosed in Davis. The Examiner apparently thinks that such a modification of an optical video disk disclosed in Lewis with a magnetic layer disclosed in Davis would result in a magnetic hard disk. The Examiner then argued that a person with ordinary skill in the art would have been motivated to use a magnetic transducer, as disclosed in Smith to read the "magnetic hard disk" created from combined teaching of Lewis and Davis. In further response to the rejections of these claims, Applicants submit that these proposed modifications to Lewis would very clearly change the principle of operation of the invention described in Lewis, and are clearly inappropriate in view of MPEP 2143.01. Lewis is clearly not related to hard disks, and any

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

proposed modification to Lewis in order to create some hypothetical hard disk violates the requirements of MPEP 2143.01 and MPEP 2143.02 insofar as the modification would change the principle of the Lewis invention and not yield a reasonable expectation of success.

Moreover, Applicants generally dispute that a person with ordinary skill in the art would have endeavored to modify Lewis in any way, in attempts to realize a magnetic hard disk. Lewis is completely unrelated to magnetic hard disks, and is instead focused on optical video disks or capacitive readout video disks. With a vast abundance of magnetic hard disks available at the time of invention, it is entirely unclear why one of ordinary skill in the art would have considered it productive to explore modifications to optical video disks for the purpose of realizing magnetic hard disks, as proposed by the Examiner. Quite the contrary, one of ordinary skill in the art would not have considered such modifications proposed by the Examiner, as these modifications would be in direct conflict with the creation of media described in Lewis.

Furthermore, the use of the magnetic transducer, as described in Smith, would further frustrate the teaching of Lewis insofar as Lewis is concerned with and directed to optical video disks which are read via radiation. Magnetic transducers typically do not use radiation to read magnetically stored data. The modification of Lewis in view of Smith proposed by the Examiner would also change the principle of operation of the invention described in Lewis, and are clearly inappropriate in view of MPEP 2143.01. Moreover, contrary to the requirements of MPEP 2143.02, a person with ordinary skill in the art would have had no reasonable expectation of success in incorporating a magnetic transducer, as described in Smith, to read media described by Lewis.

In this response, Applicants have also introduced new limitations into various other claims, which Applicants' think further distinguish the applied references. For example, claim 8 has been amended to require that the surface variations are machine-readable data patterns that define at least one bit pitch on the order of approximately 200 nanometers. This feature finds support in Applicants' specification at page 10, lines 25-26. Also, claim 16 has been amended to require that the surface variations project from the medium a height less than 20 nanometers. This feature finds support in Applicants' specification at page 10, lines 30-31.

Also, in addition to the amendments addressed above, independent claims 27-32 have been further amended to require the surface variations be arranged to define a topology which

Application Number 09/730,199
Responsive to Office Action mailed March 3, 2004

creates detectable changes in ambient conditions as the flying head transducer flies over the data storage medium. Moreover, claims 31 and 32 have been amended to further recite that the flying head transducer produces a signal representative of the changes in ambient conditions. Applicants believe that these features offer additional differences to these claims, relative to the applied references.

Conclusion

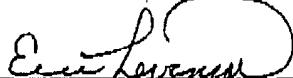
Applicants believe that all claims in this application are in condition for allowance for a number of reasons addressed above and other reasons addressed in earlier responses. Applicants respectfully request reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 09-0069. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:

5/20/04

Imation Legal Affairs
P.O. Box 64898
St. Paul, Minnesota 55164-0898
Telephone: (651) 704-3604
Facsimile: (651) 704-5951

By:



Name: Eric D. Levinson
Reg. No.: 35,814